

On the Seminal Fluid and Fecundation in the Arachnida.

By EMILE BLANCHARD.

The generative organs in the Arachnida are formed upon a peculiar plan, which is reproduced, with moderate modifications, in almost all the types of that class of animals.

The female organs are composed of membranous tubes presenting vesicles or cells in their course; the quantity of these cells is more or less considerable, and in them the eggs are developed. These tubes, usually two in number, terminating in a blind extremity, are generally of great size; this is the case in the Araneida and Tetracera (*Galeodes*). In the *Phalangia* and *Cheliferi* they are united by their posterior part so as to form a ring. In the Scorpionida they have a peculiar arrangement, so well known that I shall not dwell upon it. But in all cases they serve at once as oviducts and as reservoirs of the seminal fluid. An observation of this nature, and various experiments, enabled me to show that it was to the preservation of the semen of the male in the ovarian passages, and not to a parthenogenesis, as has been supposed, that we must attribute the faculty indicated with regard to Spiders in captivity, of remaining fertile for several years without copulating. The eggs are developed in the vesicles or cells formed by the expansions of the ovarian ducts; the vesicles being constricted at their origin, the seminal fluid never penetrates into them; and it is only when the ova, being arrived at maturity, have just passed into the oviduct, that they are impregnated. In the viviparous Arachnida, such as the Scorpions, in which the embryos are developed within the ovarian cells, impregnation nevertheless only takes place at a certain epoch,—namely when the egg has become large enough to dilate the walls of the entrance of its cell sufficiently to allow the passage of the fertilizing fluid. In *Phalangium* and *Chelifer* the female apparatus is still more complicated: there exists a true uterus, in which the eggs must remain for a time before being expelled.

The female apparatus of many Araneida, especially of those species which live only one season, consists simply of the ovarian tubes united near the orifice so as to form a short common oviduct; but in those Araneida whose existence is prolonged for several years, and whose fecundity must persist after a single copulation (*Segestriæ*, *Dysderæ*, &c.), there is a special reservoir, a sort of copulatory sac with fibrous walls opening outwards with the common oviduct, and thus arranged to receive the liquid of the male directly during copulation.

In these Araneida, also, the seminal fluid presents a remarkable character. Whilst in the Arachnida generally (in the Araneida, Scorpionida, and Phalangiida) we see, swimming in this fluid, filiform spermatozoids and the little vesicles in which, as we know from the observations of Kölliker, Wagner, and others, the spermatozoids are formed, we find in the *Segestriæ*, *Dysderæ*, &c., bodies of the form of a flattened sphere, very regular, and so large that, when a

little drop of the fluid is spread upon a glass plate, a multitude of small granules are perceived by the naked eye. These granules, or rather capsules, measure from $\frac{1}{100}$ th to $\frac{1}{50}$ th of a millimetre. Under a magnifying power of 300 to 400 diameters, an immense quantity of filiform spermatozoids, regularly disposed from the centre to the circumference, may be distinguished in their interior. By compressing one of these capsules with a plate of thin glass, it is made to burst, and then the spermatozoids escape, animated by movements which leave no doubt as to their nature.

The ordinary small vesicles in which the spermatozoids are formed continue their development here by increasing considerably in size, and thus become to a certain extent spermatophora. These corpuscles are all found in the same state during a great part of the year, both in the seminal receptacles of the females and in the testes and the copulatory joints of the palpi of the males. At the period when the eggs are to be fertilized, the spermatophorous capsules burst, and then, the spermatozoids being set free, the seminal fluid presents its ordinary aspect.—*Comptes Rendus*, April 9, 1860, p. 727.

Note on the Larva of a Nematode Worm, and on some remarkable peculiarities of the Generative Organs in the Nematoda.

By A. SCHNEIDER.

M. Schneider calls attention to a sort of alternation of generations in a Nematode worm, which he calls *Alloionema appendiculatum*. In the Black Slug (*Arion ater*) he found the larva of a Nematode worm, possessing neither a mouth nor an anus, but simply the rudiments of an intestinal canal and of generative organs. This larva is further characterized by the existence of a curious appendage on each side of the posterior part of the body. When these larvæ are placed in animal matter in a state of decomposition, they become developed, acquire a mouth, and attain their sexual maturity. These animals then propagate during a great number of generations, but without passing again through the larval phase observed in the *Arion*.

Another interesting discovery of M. Schneider's is that of a hermaphrodite Nematode worm, the first with which we are acquainted. He gives it the name of *Pelodytes hermaphroditus*. This animal occurs in the larval state in Snails. When an individual is placed by itself in a watch-glass with animal substances in a state of decomposition, it soon attains its sexual maturity. Spermatozoids are first seen to make their appearance in the generative tube, and then eggs; fecundation takes place, and a new generation is brought forth. To those who know the perfect similarity which exists between the evolution of ova and that of spermatozoids in the Nematoda, this fact, notwithstanding the great interest attaching to it, cannot be surprising.—*Siebold und Kölliker's Zeitschrift*, 1859, p. 176.